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(Reaffirmed 2004)

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दृष्टिक्षीणों के लिए मापन युक्तियाँ — विशिष्टि

भाग 3 गोनियोमीटर

Indian Standard

MEASURING DEVICES FOR VISUALLY IMPAIRED PERSONS — SPECIFICATION

PART 3 GONIOMETER

ICS 11.180

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

August 2000

Price Group 2

Artificial Limbs, Rehabilitation Appliances and Equipment for the Disabled Sectional Committee, MHD 10

FOREWORD

This Indian Standard (Part 3) was adopted by the Bureau of Indian Standards, after the draft finalized by the Artificial Limbs Rehabilitation Appliances and Equipment for the Disabled Sectional Committee had been approved by the Medical Equipment & Hospital Planning Division Council.

Goniometer is a measuring device which looks like a protector. It is used by visually impaired persons for measuring angles required in simple geometry or at the work place in the industry.

This standard has been published in 3 parts. Other parts of the standards are:

Part 1 Scale, general purposes
Part 2 Tape

These is no ISO/IEC standard on the subject. This standard has been prepared based on indigenous manufacturers data/practics prevalent in the field in India.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (revised)‘. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

MEASURING DEVICES FOR VISUALLY IMPAIRED PERSONS — SPECIFICATION

PART 3 GONIOMETER

1 SCOPE

1.1 This standard (Part 3) specifies the requirements of goniometer for visually impaired persons.

2 REFERENCES

2.1 The following Indian Standards contain provisions which, through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards:

IS No.	*Title*
410 : 1977	Cold rolled brass sheet, strip and foil *(third revision)*
1068 : 1993	Electroplated coatings of nickel plus chromium and copper plus nickel plus chromium *(third revision)*
1359 : 1992	Electroplated coatings of tin *(third revision)*
1993 : 1993	Single cold-reduced tinplate and cold-reduced black plate – electrolytic and hot-dipped tinplate sheet and blackplate sheet *(third revision)*
3138 : 1966	Hexagonal bolts and nuts (M 42 to M 150)
6911 1992	Stainless steel plate, sheet and strip *(first revision)*

3 SHAPE AND DIMENSIONS

3.1 The shape and dimensions shall be as shown in Fig. 1 and Fig. 2.

4 MATERIAL

4.1 Dial

4.1.1 The dial shall be made of sheet of any of the following materials :

a) Brass conforming to IS 410,
b) Stainless steel conforming to IS 6911,
c) Tinplate conforming to IS 1993, or
d) Plastic or any other non-pliable material.

4.1.2 The thickness of plastic material shall be 1.5 mm, *Min* and that of metallic material 1.20 mm, *Min.*

4.1.3 The recommended plastic materials are polystyrene, acrylic or rigid polyvinyl chloride.

4.2 Protractor

The protractor 'B' shall be made of brass conforming to IS 410 or stainless steel sheet conforming to IS 6911 of thickness 7 mm, *Min.*

4.3 Nut

The nut 'A' shall be made of brass or any other hard metal and shall conform to IS 3138.

5 CONSTRUCTION

5.1 The goniometer shall be of open centre pattern if made from brass, stainless steel or tinplate and of solid

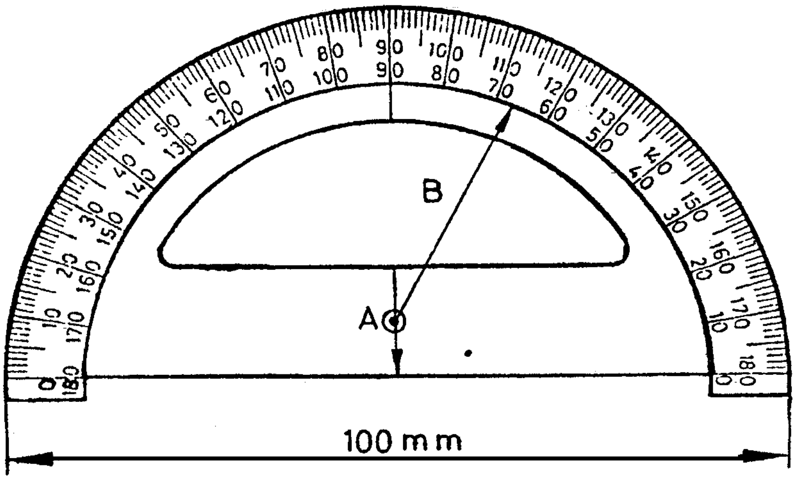
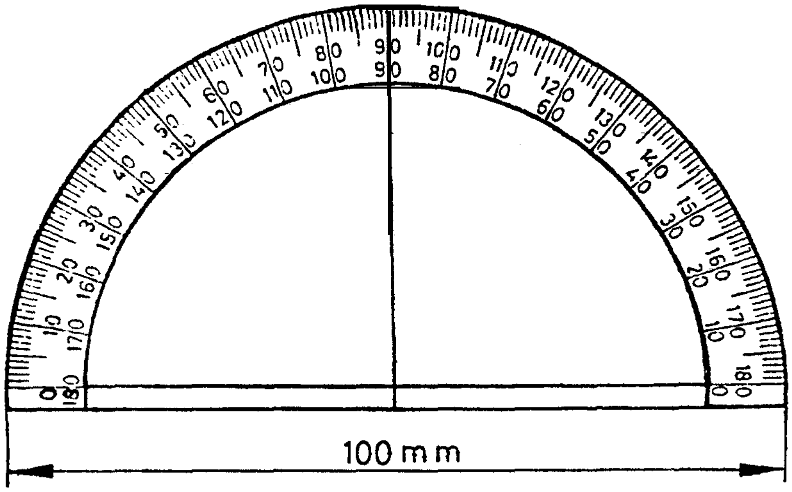


FIG. 1 GONIOMETER (OPEN CENTRE)



Fro.2 Goniometer Solid

pattern if made from plastic sheet. In the open centre pattern, the distance from the opening to the edge shall not be less than 15 percent of the nominal size.

5.2 Did

The dial shall be semi-circular in shape and generally of 100 ± 1.5 mm diameter. It shall be graduated to from 0 to 180” as shown in Fig. 1.

5.3 Protractor

The goniometer may have two strips in some cases.

6 GRADUATIONS

6.1 All graduations shall be cut, stamped or engraved on the dial. These shall be clear, fine and filled with black colour so as to ensure good legibility without the use of magnifying glass.

The thickness of the graduation lines shall not extend 0.2 mm. The graduations shall be uniform and of nominal length recommended below:

a) 10° graduations	10 mm
b) 5° graduations	5 mm
c) 1° graduations	3mm

6.2 The height of the figures shall be between 2.0 to 2.5 mm. The circumference of the goniometer shall be graduated on the underside by radial lines for transparent goniometer and on the upper side for metallic goniometers and opaque plastic goniometers.

6.3 No graduation shall extend beyond the base line (which is the line joining the graduations 0 and 180”). The base line shall be at least 3 mm away from the bottom straightedge and parallel to it.

6.4 Two straight lines, one in continuation of graduations 0 to 180” and the other perpendicular to it through 90° graduation mark shall be drawn completely to meet at the centre in case of solid pattern as illustrated in Fig. 2. In case of open centre pattern, a line shall be drawn joining the 0 and 180” graduations. A perpendicular line which on extension shall coincide with the graduation mark of 90°, shall be marked to indicate the centre of the circumference.

NOTE-It should always be kept in mind that fewer the markings. the less confusing it is for the user.

6.5 Braille Markings

The dial shall be embossed with braille markings at every 15” and with special markings at every 45”. In case of bigger dials. the number of braille markings may be increased to suit the users’ convenience.

7 WORKMANSHIPANDFINISH

7.1 The plastic material used shall be free from blisters, porosity or other defects.

7.2 Depending on the material used for the instrument, it shall be electroplated in accordance with IS 1068 or IS 1359.

7.3 All markings shall be so embossed that they are clearly legible.

7.4 The strip(s) shall be well secured so that the readings can be taken with ease.

7.5 All sharp edges shall be rounded.

8 TEST

8.1 The movable strip(s) shall be rotated to operate for 100 times, Min. They shall not become loose or shift from their position.

9 MARKING

9.1 Each goniometer shall be marked indelibly and clearly on its surface with the indication of the source of manufacture and its type.

9.2 **BIS Certification Marking**

The goniometer may also he marked with the Standard Mark.

The use of the Standard Mark is governed by the provisions of the *Bureau **of Indian Standards Act,*** 1986 and the Rules and Regulations made-thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers, may be obtained from the Bureau of Indian Standards.

10 PACKING

10.1 Each goniometer shall be packed in a polyethylene bag. Alternatively, the packing may be done as agreed to between the purchaser and the supplier.

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